

1. A mechanical seal for mounting to a housing containing a rotating shaft, said mechanical seal comprising:

a single rotatable seal ring having a pair of concentric seal faces to form a radially inner seal face and a radially outer seal face, said rotatable seal ring having an axially extending passage formed therein for allowing passage of a barrier fluid therethrough,

first and second stationary seal rings, each having a seal face, wherein the seal face of the first stationary seal ring contacts the radially outer seal face of the rotatable seal ring and the seal face of the second stationary seal ring contacts the radially inner seal face of the rotatable seal ring,

a sleeve adapted to be mounted about the rotating shaft and rotatably coupled thereto and to the rotatable seal ring, said sleeve having a flange portion that is configured for housing at least a portion of the rotatable seal ring, and

a gland for housing at least partially the single rotary seal ring and the first and second stationary seal rings.

2. The mechanical seal of claim 1, wherein the rotatable seal ring the first and second stationary seal rings are configured and arranged to provide for first and second piston areas on a face wall of the rotatable seal ring adjacent an inner surface of the flange that allow the barrier fluid to exert pressure across about 140% of the contact area of the seal face contact areas.

3. The mechanical seal of claim 2, wherein the rotatable seal ring the first and second stationary seal rings are configured and arranged to provide for a third piston area on a non-seal face wall opposite of the rotatable seal ring opposite the radially outer seal face, a fourth piston area on a non-seal face wall opposite the seal face of the first stationary seal ring, and a fifth piston area on a non-seal face wall opposite the seal face of the second stationary seal ring.

4. The mechanical seal of claim 1, wherein the pressure forces exerted on the first and second piston areas are generally offset by the pressure forces exerted on the fourth and fifth piston areas.

5. The mechanical seal of claim 1, wherein the seal is operable in both positive and negative pressure conditions.

6. The mechanical seal of claim 1, wherein the seal is operable independent of O-ring size.
7. The mechanical seal of claim 1, wherein the seal is free of a shuttle element.